

**A1.1.1.1**

Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents)

1. Order the following numbers from greatest to least.  $8.\bar{4}, \frac{25}{3}, \sqrt{72}, \frac{35}{4}$

A.)  $\sqrt{72}, \frac{25}{3}, \frac{35}{4}, 8.\bar{4}$

C.)  $\frac{35}{4}, \sqrt{72}, 8.\bar{4}, \frac{25}{3}$

B.)  $\frac{25}{3}, \sqrt{72}, \frac{35}{4}, 8.\bar{4}$

D.)  $\frac{35}{4}, \frac{25}{3}, 8.\bar{4}, \sqrt{72}$

2. Complete the comparison  $-0.75$  \_\_\_\_  $-\frac{3}{4}$ .

A.)  $<$

C.)  $=$

B.)  $>$

D.)  $\neq$

3. Choose the correct comparison for the following numbers:  $0.46, 104\%, \frac{5}{14}$

A.)  $0.46 < \frac{5}{14} < 104\%$

C.)  $104\% > 0.46 > \frac{5}{14}$

B.)  $104\% > \frac{5}{14} > 0.46$

D.)  $\frac{5}{14} > 104\% > 0.46$

4. Which list of numbers is in order from least to greatest?

A.)  $2, \sqrt{5}, \sqrt{32}, 3$

C.)  $2, \sqrt{5}, 3, \sqrt{32}$

B.)  $\sqrt{32}, 3, \sqrt{5}, 2$

D.)  $2, 3, \sqrt{5}, \sqrt{32}$

5. Complete the comparison  $\frac{16}{17}$  \_\_\_\_  $99.8\%$

A.)  $>$

C.)  $<$

B.)  $=$

D.)  $\geq$

6. Simplify:  $\sqrt{243}$

A.) 9

C.) 81

B.)  $81\sqrt{2}$

D.)  $9\sqrt{3}$

7. Simplify:  $\sqrt{162}$

A. 54

C.)  $9\sqrt{2}$

B.  $81\sqrt{2}$

D.) 6

8. Simplify:  $\sqrt{640}$

A.)  $8\sqrt{10}$

B.)  $160\sqrt{2}$

C.)  $20\sqrt{2}$

D.)  $64\sqrt{10}$

9. Which value of  $x$  makes the expression  $3\sqrt{53x}$  equivalent to  $21\sqrt{53}$ ?

A.) 147

B.) 441

C.) 7

D.) 49

10. The expression  $\sqrt{85x}$  should be further simplified for which value of  $x$ ?

A.) 59

B.) 94

C.) 3

D.) 235

#### A1.1.1.2

Apply number theory concepts to show relationships between real numbers in problem-solving settings.

11. What is the greatest common factor of the monomials:  $78x^2y^2z^4$  and  $12x^2yz^2$

A.)  $156x^4y^3z^6$

B.)  $156x^2y^2z^4$

C.)  $6x^2y^2z^4$

D.)  $6x^2yz^2$

12. What is the greatest common factor of the monomials:  $21xy^4z^2$  and  $77x^3y^2$

A.)  $231x^4y^6z^2$

B.)  $7x^3y^4z^2$

C.)  $7xy^2$

D.)  $231x^3y^4z^2$

13. What is the least common multiple of the monomials:  $9xy^4$  and  $5x^2y^2$

A.)  $45x^3y^6$

B.)  $xy^2$

C.)  $x^3y^6$

D.)  $45x^2y^4$

14. What is the least common multiple of the monomials:  $18u^4vw^4$  and  $30u^4v^3w^3$

A.)  $90u^4v^3w^4$

B.)  $90u^8v^4w^7$

C.)  $6u^8v^4w^7$

D.)  $6u^4vw^3$

15. What is the least common multiple of the monomials:  $9x^3y^3z^4$ ,  $15x^3y^4z^4$ , and  $5x^2y^3z^3$

A.)  $3x^3y^3$

B.)  $45x^6y^7z^8$

C.)  $3x^3y^3z^4$

D.)  $45x^3y^4z^4$

**A1.1.1.3**

Use exponents, roots, and/or absolute values to solve problems.

16. Evaluate  $-2|n+5|$  when  $n = -11$

A.) -8

B.) 12

C.) 0

D.) -12

17. Simplify:  $2(13 - |-11 + 2|) - |10 - 7|^2$

A.) -10

B.) 8

C.) -1

D.) -9

18. Simplify:  $\frac{7\sqrt{12} + 6\sqrt{108}}{\sqrt{2}}$

A.)  $25\sqrt{3}$

B.)  $25\sqrt{6}$

C.)  $50\sqrt{3}$

D.)  $10\sqrt{6}$

**A1.1.1.4**

Use estimation strategies in problem-solving situations.

19. George's car can travel about 28 miles per gallon of gas. If the car has used 10 gallons of gas, approximately how far has George driven?

A.) 2.8

B.) 38

C.) 18

D.) 280

20. It costs a shoe company \$20.67 to produce one pair of running shoes. The company sells each pair of shoes for \$75.07 in stores. If the company sells 145 pairs of running shoes in the month of March, what is the company's approximate profit from running shoes in March?

A.) \$7,830.00

B.) \$13,920.00

C.) \$10,875.00

D.) \$7,975.00

21. A fast food restaurant sells between 164 and 328 hamburgers per day. If the company profits \$82.00 per 82 hamburgers sold, approximately how much does the company profit in one year from hamburgers?

A.) \$89,790.00

B.) \$179,580.00

C.) \$7,362,780.00

D.) \$29,930.00

**A1.1.1.5**

Simplify expressions involving polynomials.

22. Simplify:  $(8x^2 - 4x - 8) + (3x^2 - 7x - 3)$

A.)  $11x^2 - 11x - 11$

B.)  $11x^2 - 3x + 11$

C.)  $5x^2 - 11x - 5$

D.)  $11x^2 - 3x - 11$

23. Simplify:  $(6x^3 + 3x^2 - 5) + (4x^3 - 4x - 3)$

A.)  $10x^3 + 3x^2 - 4x - 8$

B.)  $2x^3 + 3x^2 - 4x - 2$

C.)  $10x^3 - 4x + 8$

D.)  $10x^3 + 3x^2 - 4x + 8$

24. Simplify:  $(9x^2 + 6x + 4) - (3x^2 + 2x + 6)$

A.)  $6x^2 + 4x - 2$

B.)  $12x^2 + 4x - 10$

C.)  $6x^2 + 8x - 2$

D.)  $12x^2 + 4x - 2$

25. Factor the following expression completely:  $x^4 - 1$

A.)  $(x^2 - 1)(x^2 + 1)$

B.)  $(x - 1)(x + 1)(x^2 + 1)$

C.)  $(x - 1)(x^3 + 1)$

D.)  $(x - 1)(x + 1)(x - 1)(x + 1)$

26. Factor the following expression completely:  $4x^2 - 4$

A.)  $4(x - 1)^2$

B.)  $4(x + 1)(x - 1)$

C.)  $(4x + 1)(x - 1)$

D.)  $4(x^2 - 1)$

27. Factor the polynomial expression:  $x^2 - 10x + 25$

A.)  $2x^2 - 25$

B.)  $x^2 - 25$

C.)  $(x - 10)^2$

D.)  $(x - 5)^2$

28. Simplify the following expression:  $\frac{3x^3 + 18x^2 - 15x}{3x}$

A.)  $3x^3 + 18x^2 - 5$

B.)  $19x^2 + 5x$

C.)  $x^2 + 6x - 5$

D.)  $x^2 + 15x - 12$

29. Simplify the following expression:  $\frac{x^{14} - 16}{x^7 + 4}$

A.)  $x^7 - 12$

B.)  $x^{14} - 12$

C.)  $x^7 - 4$

D.)  $x^7 + 4$

30. Simplify the following expression:  $\frac{-x - 6}{x^2 - x - 42}$

A.)  $\frac{1}{x - 7}$

B.)  $\frac{1}{x + 6}$

C.)  $\frac{-1}{x - 6}$

D.)  $\frac{-1}{x - 7}$

**A1.1.2.1**

Write, solve, and/or graph linear equations using various methods.

31. Erica went shopping for new clothes for school. She bought a pair of jeans for \$70.19 and several shirts for \$8.63 each. If  $x$  represents the number of shirts she bought, which of the following equations should be used to find  $y$ , the total cost of Erica's shopping trip?

A.)  $x = \$8.63y + \$70.19$

C.)  $y = \$8.63x + \$70.19$

B.)  $y = \$70.19x + \$8.63$

D.)  $x = \$70.19y + \$8.63$

32. LeAnne leaves town traveling at an average speed of 49 mph. After 4 hours, Bart leaves town traveling in the same direction at an average speed of 67 mph. Which of the following equations could be used to represent the distance between LeAnne and Bart after  $x$  hours?

(Let  $x$  represent the time in hours that Bart has been traveling and  $y$  represent the distance between LeAnne and Bart.)

A.)  $y = 18x$

C.)  $y = 196 - 67x$

B.)  $y = 196 + 18x$

D.)  $y = 196 - 18x$

33. A company has fixed operating costs of \$2,137.00 per month with a production cost of \$15.15 per unit. If each unit brings \$33.09 in revenue, which of the following equations represents the profit for the month?

(Let  $x$  represent the number of units made per month and  $y$  represent the total profit for the month.)

A.)  $y = 48.24x - 2,137$

C.)  $y = 33.09x - 2,137$

B.)  $y = 15.15x - 2,137$

D.)  $y = 17.94x - 2,137$

34. Ann is moving from Houston to McKinney and rented a truck from U-Move truck rentals. The cost of a one-day truck rental is given by  $C(m) = 0.5m + 50$ , where  $m$  is the number of miles driven. If Ann drives 280 miles, what is the cost of the truck rental?

A.) \$195

C.) \$218

B.) \$190

D.) \$140

35. Solve for  $x$ :  $7(2x - 8) = 77x$

A.)  $x = \frac{19}{2}$

C.)  $x = -\frac{208}{209}$

B.)  $x = \frac{208}{209}$

D.)  $x = \frac{209}{208}$

36. Juan scored 24 points in the first half of the basketball game, and he scored  $p$  points in the second half of the game. Write an expression to determine the number of points he scored in all. Then, find the number of points he scored in all if he scored 11 points in the second half of the game.

A.)  $24 + p$ ; 35 points

C.)  $24p$ ; 35 points

B.)  $24 - p$ ; 13 points

D.)  $\frac{24}{p}$ ; 13 points

37. Write the equation that describes the line with slope = 2 and y-intercept =  $\frac{3}{2}$  in slope-intercept form.

A.)  $2x + y = \frac{3}{2}$

C.)  $y = 2x + \frac{3}{2}$

B.)  $y = \frac{3}{2}x + 2$

D.)  $x = 2y + \frac{3}{2}$

38. Write the equation that describes the line in slope-intercept form.

Slope = 4 and point (3, -2) is on the line.

A.)  $y = 4x + 14$

C.)  $y = 4x + 10$

B.)  $y = 4x - 14$

D.)  $y = 4x - 2$

39. The water level of a river is 34 feet and it is receding at a rate of 0.5 foot per day. Write an equation that represents the water level,  $w$ , after  $d$  days. In how many days will the water level be 26 feet?

A.)  $w = 34d - 0.5$  In 120 days, the water level will be 26 feet.

B.)  $w = -0.5d + 34$  In 16 days, the water level will be 26 feet.

C.)  $w = 34d + 0.5$  In 16 days, the water level will be 26 feet.

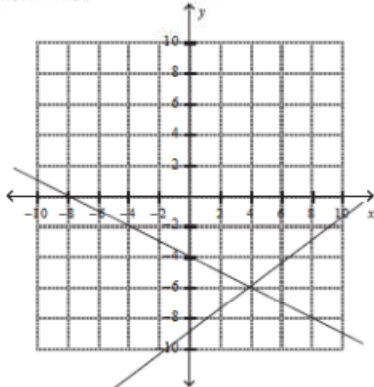
D.)  $w = -0.5d - 34$  In 120 days, the water level will be 26 feet.

#### A1.1.2.2

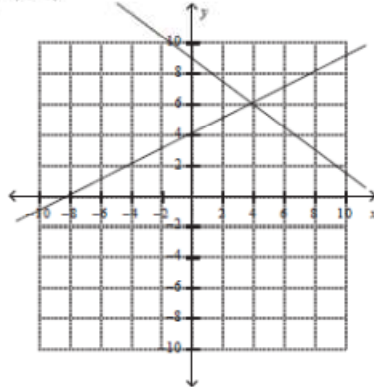
Write, solve, and/or graph systems of linear equations using various methods.

40. Solve the system  $\begin{cases} 3x + 4y = -36 \\ -2x + 4y = -16 \end{cases}$  by graphing.

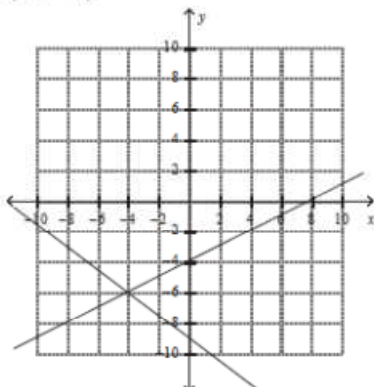
A.) (4, -6)



C.) (4, 6)



B.) (-4, -6)



D.) (-4, 6)

